

CLAIMS

1. A zoom lens comprising, in order from an object side to an image side:

a first lens unit of positive refractive power;

a second lens unit of negative refractive power arranged to move during variation of magnification;

a third lens unit arranged to compensate for shift of an image plane due to the variation of magnification; and

a fourth lens unit of positive refractive power,

wherein said fourth lens unit has a first lens subunit of negative refractive power, and an image is displaced by moving said first lens subunit in such a way as to have a component perpendicular to an optical axis of said zoom lens.

2. A zoom lens according to claim 1, wherein said first lens subunit consists of one positive lens and one negative lens.

3. A zoom lens according to claim 1, wherein said first lens subunit consists of one positive lens and two negative lenses.

4. A zoom lens according to claim 1, wherein said fourth lens unit further has a second lens subunit of positive refractive power on the image side of said first

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lens subunit.

5. A zoom lens according to claim 4, wherein said third lens unit is of positive refractive power, and said fourth lens unit consists of, in order from the object side to the image side, said first lens subunit of negative refractive power and said second lens subunit of positive refractive power.

6. A zoom lens according to claim 4, wherein the following condition is satisfied:

$$\alpha' - \alpha < -0.45$$

where α is a converted inclination angle of incidence on a lens surface on the most object side of said first lens subunit, and α' is a converted inclination angle of exit from a lens surface on the most image side of said first lens subunit.

7. A zoom lens according to claim 4, wherein the following condition is satisfied:

$$v_n(4S) - v_p(4S) > 10$$

where $v_n(4S)$ is, when said first lens subunit includes only one negative lens, an Abbe number of material of the negative lens included in said first lens subunit or, when said first lens subunit includes a plurality of negative lenses, a mean value of Abbe numbers of material of all the negative lenses included in said first lens subunit, and $v_p(4S)$ is, when said first lens subunit

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includes only one positive lens, an Abbe number of material of the positive lens included in said first lens subunit or, when said first lens subunit includes a plurality of positive lenses, a mean value of Abbe numbers of material of all the positive lenses included in said first lens subunit.

8. A zoom lens according to claim 4, wherein the following condition is satisfied:

$$vp(4R) - vn(4R) > 10$$

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where $vp(4R)$ is, when said second lens subunit includes only one positive lens, an Abbe number of material of the positive lens included in said second lens subunit or, when said second lens subunit includes a plurality of positive lenses, a mean value of Abbe numbers of material of all the positive lenses included in said second lens subunit, and $vn(4R)$ is, when said second lens subunit includes only one negative lens, an Abbe number of material of the negative lens included in said second lens subunit or, when said second lens subunit includes a plurality of negative lenses, a mean value of Abbe numbers of material of all the negative lenses included in said second lens subunit.

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9. A zoom lens according to claim 1, wherein an image forming magnification of said second lens unit varies within a range including $-1\times$ during the variation of magnification, an image forming magnification of said

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third lens unit varies within a range including $-1\times$ during the variation of magnification, and the following conditions are satisfied:

$$5 < Z2$$

$$0.15 < Z2 / Z$$

where Z2 is a rate of variation of lateral magnification of said second lens unit, and Z is a zoom ratio of said zoom lens.

10. A zoom lens according to claim 1, wherein an extender conversion optical system for varying the focal length of said zoom lens is insertably and detachably disposed in a position on the image side of said first lens subunit.

11. A photographing apparatus comprising:
a zoom lens according to claim 1; and
a casing holding said zoom lens.

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